**FAOSTAT domain Emission indicators. Methodological note.**

## Dataset Information:

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| **Title** | **Emissions indicators** |
| **Abstract** | The FAOSTAT domain **Emissions indicators** disseminates indicators on sectoral *shares* of total national greenhouse gas (GHG) emissions as well as three indicators of emissions intensity: per capita emissions; emissions per value of agricultural production; and emissions per area of agricultural land. Sectoral shares are computed by agrifood system component (farm gate, land use change, pre- and post-production) as well as by the sectors of National GHG Inventories used for reporting to the United Nations Framework Convention on Climate Change (UNFCCC) (Agriculture, Land Use Land Use Change and Forestry, Energy, Industrial Processes and Product Use, Waste, International Bunkers). Shares are computed for emissions of single component gases—carbon dioxide ($CO_2$), methane ($CH_4$), nitrous oxide ($N_2O$), fluorinated gases (F-gases) — as well as for $CO_2$ equivalent ($CO_2$eq), with respect to absolute emissions taken from the FAOSTAT Emissions totals domain. Population data used in per capita emissions are taken from the FAOSTAT population domain. The values used for the emissions intensity by production value are taken from the FAOSTAT Value of Agricultural Production domain. Values for the emissions intensity by agricultural land area are taken from the FAOSTAT Land Use domain. Data are provided by country and relevant regional groups, including the Annex I and Non-Annex I Parties to the UNFCCC, over the period 1990–2024. |
| **Supplemental** | The domain Emissions indicators contains the following data categories available for download by items: *a)* shares of total $CO_2$eq emissions; *b)* shares of total emissions from single gases – carbon dioxide ($CO_2$), methane ($CH_4$), nitrous oxide ($N_2O$) and aggregate F-gases. The latter includes emissions of various Hydrofluorocarbons (HFCs), Perfluorinated compounds (PFCs), $SF_6$ and $NF_3$ gases; *c)* per capita emissions (tonnes per capita).<br><br>The domain provides global knowledge on relevant to food and agriculture. Data are provided using FAO classifications of food and agriculture activities, used by countries for reporting statistics to FAO, as well as classifications of Intergovernmental Panel on Climate Change (IPCC 2006), used for country reporting to UNFCCC. |
| **Creation Date** | 2016 |
| **Last Update** | 2026 |
| **Data Type** | Climate Change - Emissions |
| **Category** | Environment |
| **Time Period** | 1990–2024 |
| **Periodicity** | Annual |
| **Geographical Coverage** | World |
| **Spatial Unit** | 201 countries and territories |
| **Language** | Multilingual (EN, FR, ES) |

## Methodology and Quality Information:

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| **Methods and processing** | ***Overview***<br><br>**Global Warming Potential (GWP)**<br><br>Emissions in singles gases were converted into their $CO_2$ equivalents using the IPCC (2014) AR5 global warming potential coefficients. Specifically, we used:<br><br>GWP($CO_2$)=1; GWP($CH_4$)=28; GWP($N_2O$)=265.<br><br>**Shares**<br><br>Two types of shares are estimated, by country and year, as follows: |

*i) Share of each sector/category in total $CO_2$eq emissions*

These shares represent the contribution to total emissions (in $CO_2$ equivalent) from all gases and sectors/categories in scope of this domain. *Total emissions from all sectors including LULUCF* are used as denominator.

$$Share\ of\ sector_{(A,I,Y)} = \left(\frac{Emiss.CO_2eq_{(A,I,Y)}}{Emiss.CO_2eq_{(A,\sum I,Y)}}\right) \times 100$$

where:

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| $Share\ of\ sector_{(A,I,Y)}$ | Share of sector $I$ (%) in total $CO_2$eq emissions for country *A*, year *Y* |
| $Emiss.CO_2eq_{(A,I,Y)}$ | Emissions (Kt $CO_2$eq) from sector $I$, for country *A* and year *Y* |
| $Emiss.CO_2eq_{(A,\sum I,Y)}$ | Emissions (Kt $CO_2$eq) from all sectors $\sum$I (with LULUCF emissions) for country *A* and year *Y* |
| $A, I, Y$ | Country, sector, and year, respectively |

*ii) Share of each sector in the emissions from each gas*

This share represents the contribution of each sector to total emissions for each gas ($N_2O$, $CH_4$, $CO_2$ or F-gases).

$$Share\ of\ sector_{(A,I,G,Y)} = \left(\frac{Emiss.Gas_{(A,I,G,Y)}}{Emiss.Gas_{(A,G,\sum I,Y)}}\right) \times 100$$

where:

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| $Share\ of\ sector_{(A,I,G,Y)}$ | Share of sector (%) in total emissions of gas *G* from all sectors *I* for country *A* and year *Y* |
| $Emiss.Gas_{(A,I,G,Y)}$ | Emissions of gas *G* (Kt) from sector $I$, for country *A* and year *Y* |
| $Emiss.CO_2eq_{(A,G,\sum I,Y)}$ | Total emissions (Kt) of gas *G* from all sectors $\sum I$, for country *A* and year *Y* |
| $A, I, G, Y$ | Country, sector, gas and year, respectively |
| G | Gases in the scope of the domain are $CO_2$, $CH_4$, $N_2O$ and F-gases |

**Emissions per capita**

The indicator emissions per capita is computed as the contribution per person to total emissions (in $CO_2$ equivalent) for all sectors in the scope of this domain. The emissions per capita is computed as:

$$Emissions\ per\ capita_{(A,I,Q,Y)} = \frac{Emiss.Q_{(A,I,Y)}}{Population_{(A,Y)}}$$

where:

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|---|---|
| $Emissions\ per\ capita_{(A,I,Q,Y)}$ | Contribution per person (tonnes per capita) in total emissions from all sectors *I* for country *A* and year *Y* |
| $Emiss.Q_{(A,I,Y)}$ | Total emissions in $CO_{2eq}$ from sector I, country A and year Y |
| $Population_{(A,Y)}$ | Population (in 1 000 people) of country A in year Y |
| *A, I, Q, Y* | A (Country); I (Sector), Q (total emissions CO2eq); Y (Year) respectively |

Values for the denominator are derived from the FAOSTAT domain Annual Population from the Item-Element combination Population - Est. & Proj. – Total Population - Both Sexes.

**Emissions per value of agricultural production**

This intensity indicator is computed as the total emissions from *farm gate; emissions on agricultural land; and IPCC agriculture* relative to the value of agricultural production (kilograms per dollar) such that:

$$Emissions\ per\ value\ of\ agricultural\ production_{(A,K,Q,Y)} = \frac{Emiss.Q_{(A,K,Y)}}{Value\ of\ production_{(A,Y)}}$$

Where:

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| $Emissions\ per\ value\ of\ agricultural\ production_{(A,K,Q,Y}$ | Emissions (in kg $CO_2$eq /USD) for sector *K* , for country *A* and year *Y* |
| $Emiss.Q_{(A,K,Y)}$ | Total emissions in $CO_2$eq from sector *K*, country *A* and year *Y* |
| $Value\ of\ production_{(A,Y)}$ | Value of total agricultural production (in 1000 I.$, constant rate 2014-2016) of country *A* in year *Y* |
| *A, K, Q, Y* | A (Country); K (Sectors: farm gate, emissions on agricultural land; IPCC agriculture), Q (GHG emissions in kilotonnes $CO_2$eq); Y (Year) |

Values for the denominator are derived from the FAOSTAT domain Value of Agricultural Production from the Item-Element combination Agriculture (Total) – Gross Production Value (constant 2014-2016 thousand International $).

**Emissions per area of agricultural land**

The indicator emissions per area of agricultural land is computed as the total emissions (kg $CO_2$eq) from *farm gate, emissions on agricultural land and IPCC agriculture* relative to agricultural land area such that:

$$Emissions\ per\ area\ of\ agricultural\ land_{(A,K,Y)} = \frac{Emiss.Q_{(A,K,Y)}}{Agric.land\ area_{(A,Y)}}$$

Where:

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| $Emissions\ per\ area\ of\ agricultural\ land_{(A,K,Y)}$ | Emissions (tonnes $CO_2$eq per ha of agricultural land) from sectors K for country *A* and year *Y* |
| $Emiss.Q_{(A,K,Y)}$ | Total emissions in $CO_2$ equivalent from sector *K*, country *A* and year *Y* |
| $Agric.land\ area_{(A,Y)}$ | Agricultural land area (in 1 000 ha) of country *A* in year *Y* |
| *A, K, Q, Y* | A (Country); K (Sectors: farm gate, emissions on agricultural land; IPCC agriculture), Q (GHG emissions in kilotonnes $CO_2$eq); Y (Year) |

Values for the denominator are derived from the FAOSTAT domain Land Use from the Item-Element combination Agricultural land – Area.

**References**

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| **Data Collection Method** | Computed |
| **Completeness** | 100% |
| **Useful links** | http://www.fao.org/economic/ess/environment/en/<br>https://www.fao.org/faostat/en/#data/EM |

## Distribution Information:

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